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Non-Irrigated Pasture Establishment and Maintenance

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Introduction

Small acreage lots are becoming increasingly common throughout Utah. Many of these units have limited or no irrigation. This presents an added challenge to the owner or manager. Improper grazing of non-irrigated pastures quickly reduces the number and vigor of desirable perennial plants. Under these conditions, desirable species disappear and invasive and noxious weeds soon dominate. Proper establishment, maintenance and grazing are necessary for productive, weed free pastures.

Establishment

Species Selection

In general, non-irrigated or dryland seeding usually limits selection to certain cool season species. Choices should be based on environmental and use conditions. Grass species include the wheatgrasses (crested, Siberian, intermediate, western, bluebunch, thickspike, and tall wheatgrass), Russian wildrye and Indian ricegrass. Legume species to choose from are: alfalfa, Utah sweetvetch and sainfoin.

Individual characteristics for these species should be reviewed to see if they will work under your specific conditions. The Intermountain Planting Guide is an

excellent resource for species information and is available online (see References).

Seedbed Preparation/Seeding

Prior to seeding, any weeds present should be eliminated. This can be accomplished by using herbicide without any soil residual such as Roundup (glyphosate). Always read the label and follow directions!

To prepare the soil, cultivate with a plow or disk and use a cultipacker or roller to firm the seedbed so that your foot print leaves a quarter inch depression. A firm seedbed helps control planting depth and ensures good seed to soil contact which aids germination. Use proper equipment - either a drill or broadcast spreader with good agitation so seed does not bridge over openers. Grasses should be planted no deeper than one half inch and legumes no deeper than one quarter inch. Accurate seed placement is critical. After seeding, cultipack or roll the seedbed again to ensure contact between seed and soil.

Plant late enough in the fall (when soil temperatures are below 40° Fahrenheit) so seed will not germinate until the following spring. This is called dormant planting, and ensures proper moisture for early spring germination.



Figure 1. It is important to have a weed-free, fine, moist, firm seedbed. The field should be plowed or disked to remove vegetation and then “firmed up” with a culti-packer, roller, or harrow. Herbicides can also be used in conjunction with cultivation to reduce weedy competition.

Management During Plant Establishment

Young growing plants need time to develop a significant root system in order to compete against weeds. It is important to defer grazing for at least two growing seasons or until plants are well established.

Maintenance

Operation and Maintenance of Seeding After Establishment

Grazing of non-irrigated pasture should be timed to correspond with plant growth. In general, for optimum production and species persistence, most species should

not be grazed until they reach a height of 8 to 12 inches and should cease before stubble height is lower than 4 to 6 inches. Grazing below the minimum stubble height will remove the plant growing point and severely limit re-growth and persistence. Because production on non-irrigated pastures depends on the amount and timing of annual precipitation, grazing pressure and grazing timing are critical. When compared to irrigated pastures, non-irrigated pastures have significantly less production and recovery potential. During periods of drought, it may be necessary to stop grazing altogether. Correct grazing allows plants enough reserves to regenerate themselves. Table 1 shows start heights and minimum stubble heights for selected species.



Figure 2. Accurate seed placement is essential when establishing a new pasture. Seed drills are a good method for planting seed if they are calibrated and seeding depth can be controlled. Seeds can also be broadcast and pressed into the soil with a roller or cultipacker. Seeding rates should be increased if broadcast methods are used.

Table 1. Start and Stop Heights for Non-Irrigated Pasture Grazing to Optimize Production.

Species	Grazing Start Height	Minimum Stubble Height
<u>Grasses</u>		
Crested wheatgrass	8-10"	4"
Intermediate wheatgrass	10-12"	5"
Siberian wheatgrass	8-10"	4"
Tall wheatgrass	12"	7"
Russian wildrye	4-6"	3"
<u>Legumes</u>		
*Alfalfa	12"	6"
Sainfoin	12"	6"

* Care should be taken when grazing alfalfa to avoid bloat.

Insects, and/or diseases should be controlled through mowing, burning, flash grazing, or pesticides as needed to maintain a healthy stand. Where stands are damaged by drought, insects, or other uncontrollable events, the stand should be replanted, overseeded, or spot planted. Thin stands may only need grazing deferment during the growing season to recover rather than replanting.

Summary

Proper establishment, maintenance and grazing of non-irrigated pastures are critical for long term productive stand life. Because plant species depend on nature precipitation for moisture, their growing seasons are limited. Careful grazing enables individual plants to recover and take advantage of available soil moisture. Healthy, weed free, non-irrigated pastures are the product of careful management and good stewardship.

References

Intermountain Planting Guide. 2001. Jensen, K.B.; Horton, W.H.; Reed, R.; Whitesides, R.E.; USDA-ARS-Forage and Range Research Lab in conjunction with Utah State University Extension, Logan, UT.

Small Pasture Management Guide for Utah. Barnhill, J.V.; Olsen, S.; Sessions, R.; Miner, F.D.; Julen-Day, T.; Hansen, N.; Garn, C.; Keonig, R.; Whitesides, R.E.; Utah State University Extension, Logan, UT, in cooperation with USDA Natural Resource Conservation Service, USDA Farm Service Agency, Utah Soil Conservation Districts and Bonneville Resource Conservation and Development Council.

Pasture and Range Seedings Planning-Installation-Evaluation. 2005. Ogle, D.; St. John, L.; Cornwell, J.; Stannard, M.; and Holzworth, L., USDA-Natural Resources Conservation Service. Boise, Idaho – Bozeman, Montana – Spokane, Washington.

Range Management Principles and Practices, Second Edition. 1995. Holechek, J.L.; Pieper, R.D.; Herbel, C.H. Prentice Hall.

(Table 1.) Growth Heights and Stages for Start of Grazing and Minimum Stubble Heights for Grazed Pasture and Hayland During the Growing Season. USDA Natural Resource Conservation Service, 528A-5.

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